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AMERICAN STATISTICAL ASSOCIATION

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JUNE-JULY 1951

Volume 5, No. 3

THE NORMAL BLOOD PRESSURE RANGE AND ITS CLINICAL IMPLICATIONS

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The American STATISTICIAN

JUNE-JULY 1951, VOL. V, NO. 3

The news publication of the
American Statistical Association

OFFICERS

President: Lowell J. Reed; *President-Elect:* Aryness Joy Wickens; *Vice-Presidents:* Dorothy S. Brady, Morris H. Hansen, Philip M. Hauser; *Directors:* Gertrude M. Cox, W. Edwards Deming, Cyril H. Goulden, John W. Tukey, Ralph J. Watkins, Louis L. Thurstone; *Secretary-Treasurer:* Samuel Weiss. *Members of the Council:* C. M. Armstrong, W. S. Brush, Jerome Cornfield, Lester R. Frankel, Paul G. Hoel, Palmer O. Johnson, H. L. Jones, T. J. Mills, Frederick Mosteller, P. R. Rider, J. R. Stockton, E. J. Swan, W. Allen Wallis, Sylvia Weyl.

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Presentation Problems
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REPORT OF THE COMMITTEE ON ELECTIONS

The Committee on Elections submits the following names to the membership for election for the year 1952:

President-Elect	William G. Cochran
Vice-President (3 years)	Walter Hoadley
(One to be elected)	David F. Votaw, Jr.
Directors (3-year term)	M. I. Gershenson
(Two to be elected)	

In accordance with the Constitution, two candidates have been nominated for each office except that of President-Elect. Additional nominations may be made within five weeks after this publication by petition signed by at least 25 members and submitted to the Secretary-Treasurer. Ballots will be mailed on November 15, at the time of the general mailing for 1952.

These candidates have been selected with a view to rounding out the membership of the Board so that it will be more broadly representative in 1952 of the Far West, the Midwest, and certain portions of the Eastern Seaboard and, at the same time, more representative of groups in the membership, particularly in the fields of social and economic statistics, educational statistics, and quality control. For the information of the membership, the officers and members of the Board who will remain in office in 1952 are as follows:

Gertrude M. Cox	Lowell J. Reed
W. Edwards Deming	John W. Tukey
Morris H. Hansen	Ralph J. Watkins
Philip M. Hauser	Samuel Weiss
Aryness Joy Wickens	

Biographies of Nominees for 1952 officers of ASA

The general interests and the experience in the Association's activities of the candidates are summarized briefly on page 4. Further details will be available when the ballots are mailed to the membership.

President-Elect

WILLIAM G. COCHRAN, Johns Hopkins University, Baltimore, Md.; statistical methods, biometrics; Vice-President of ASA, 1943-45; member of the Council (ex-officio), 1949-50; long-time Editor of the *Journal of the American Statistical Association*; chairman of the publications Committee, 1948; Program Chairman, 1945; Fellow of the Association; formerly at the University of North Carolina and Iowa State College.

CONTINUED ON PAGE 4

NEWS

ASA to evaluate statistical program of the Bureau of Mines—U. S. Government statistical projects—fall conferences and programs—ISI educational program—positions available—new publications

Nominations for District Representatives to the Council

The Constitution of the ASA provides that "one representative shall be elected from each District each year to serve a two-year term." Nominations for District Representatives must be submitted "to the Office of the Secretary-Treasurer in writing." "The four nominees receiving the largest number of nominations in their respective Districts as determined by the Committee on Elections shall be the nominees for their District."

Please send your nominations to the Office of the Secretary immediately. The nomination of Representatives to the Council is the most direct method of participating in Association affairs.

ASA Committee Evaluating Bureau of Mines Statistical Program

At the request of the Bureau of Mines the American Statistical Association has initiated a thorough investigation of the functions of the Bureau of Mines in the field of statistics. The survey is being directed by Dr. J. E. Morton with advice from an ASA Advisory Committee comprised of Dr. Raymond T. Bowman (chairman), University of Pennsylvania;; Professor Clarence D. Long, Jr., Johns Hopkins University; and Dr. Ralph J. Watkins, Dun and Bradstreet, Inc.

The study will have the following broad objectives:

1. Improvement of the quality of the statistics of the Bureau of Mines, including, but not limited to, the coverage, relevance, accuracy, clarity, validity, and timeliness of such statistics.

2. Achievement of all possible economy in the performance by the Bureau of Mines of its functions in the field of statistics, including extending the use of sampling methods.

Dr. Morton, on leave from Cornell University as Professor of Statistics, was Chief of the Statistical Research and Development Staff of the Housing and Home Finance Agency immediately prior to accepting the assignment as Director of this survey. In addition to serving on committees of the American Statistical Association and the Institute of Mathematical Statis-

tics, some of the other positions Dr. Morton has held are the following: Lecturer in Mathematics and Economics, University of Geneva; Professor of Economics and Statistics, Knox College; Staff Member, National Bureau of Economic Research; Member, Board of Directors, Social Science Research Center, Cornell University; and Technical Consultant to the Bureau of the Census. Dr. Morton was also on a special committee investigating the statistical program of the New York Division of Placement and Unemployment Insurance in 1949 and 1950.

It is anticipated that the final Association report will be submitted to the Bureau of Mines sometime in 1952.

The International Statistical Educational Program of the International Statistical Institute

One aspect of the educational program of the ISI which is of interest to American statisticians is the work which is being done on teaching aids by a subcommittee of the Statistical Educational Committee. This subcommittee is under the chairmanship of Maurice Kendell of the London School of Economics and Political Science. When staff arrangements have been completed the efforts of this subcommittee will be directed toward:

- a. Drafting a proposed list of Standard terms and symbols in the field of statistical methodology.
- b. Selecting books that should be available in several languages for the purposes of elementary and intermediate statistical education.
- c. Selecting statistical journal articles that should be collectively reprinted for more accessible use in statistical education.
- d. Preparing the chapter on "statistical terminology," as requested by the American Statistical Association, for inclusion in its handbook of Statistics.
- e. Developing course syllabuses appropriate to the needs of statistical education activities associated with the Institute's program and critically review syllabuses given for consideration.

Denver Chapter Awards ASA Student Memberships to Outstanding Students in the Area

The Denver Chapter has established an annual recognition award to outstanding students in statistics in each of the colleges of Business Administration in the Denver region.

The award is to be a year's student membership in the American Statistical Association. A chapter committee has established the standards by which the students were rated. The Deans of the colleges of Business Administration were requested to recommend their outstanding students. The first awards were presented to John Paul Griffith at the University of Denver, Bobby Bradford of the University of Colorado and Albert Prochnow at the University of Wyoming.

Training Center for Economic and Financial Statistics

The Inter American Economic and Social Council of the United Nations approved in March the program of technical cooperation of the organization of American states which included a project for a training center for economic and financial statistics to be sponsored by the Inter American Statistical Institute and the Pan American Union. This project will provide for the creation of a training center in the Western Hemisphere for a period of five years in which annual courses in economic and financial statistics will be given in order to train specialists in the techniques and statistical information.

Conference on Industrial Experimentation

The Second Conference on Industrial Experimentation sponsored by the Department of Industrial Engineering of Columbia University will be held September 17-21, 1951, on the Columbia campus. This five-day intensive Conference is designed to bring to those engaged in industry and research some of the latest developments in modern statistical methodology which are pertinent to the design, analysis, and interpretation of experiments. Emphasis will be placed on the fundamental principles which underlie the statistical design of experimental programs and the practical techniques with which to carry out these designs so as to yield the most fruitful conclusions at the least cost and in the shortest time.

Among the topics to be treated are the following: Analysis of Variance: Underlying assumptions; Models I, II, and mixed models; one of variance; problems of estimation and testing hypotheses.—Statistical concept of the

Power of a Test: Applications to Normal "t," Chi-square, and Snedecor's F tests. The construction and interpretation of power curves.

The full-time instructors will be Professors S. B. Littauer, Department of Industrial Engineering and R. E. Bechhofer, Departments of Industrial Engineering and Mathematical Statistics, Columbia University; Professor J. Wolfowitz, Department of Mathematics, Cornell University; Professor C. Daniel, Department of Chemical Engineering, Polytechnic Institute of Brooklyn. Professor C. W. Churchman, of Case Institute of Technology, and Dr. Herbert Solomon, of ONR, will be special lecturers.

The fee for the Conference, including all books and supplies and all lunches and dinners at the Men's Faculty Club, is \$150. Inquiries or requests for brochures and applications should be addressed to Professor S. B. Littauer, Department of Industrial Engineering, Columbia University, New York City 17.

Enrollment limited to 50.

Fulbright Awards for 1952-53

U. S. Government grants under the auspices of the Department of State and the Board of Foreign Scholarships for the term 1951-53 should be applied for before October 15, 1951. There are approximately 230 awards to be given in university lecturing and advanced research in the fields of Education, the Humanities, Natural Sciences and Social Sciences. Graduate students wishing to enroll for courses abroad or to work on a directed program of studies at the predoctoral level should apply to the Institute of International Education in New York City.

Countries participating in the Fulbright Program for the term beginning next fall include United Kingdom, Norway, Netherlands, Belgium and Luxembourg, France, Austria, Italy, Greece, Egypt, Turkey and Iran.

Full information may be obtained by writing to the Executive Secretary of the Committee on International Exchange of Persons, Conference Board of Associated Research Councils, 2101 Constitution Avenue, Washington, D. C.

Call for Papers

Anyone desiring to present a paper at the Contributed Papers session of the Biometric Section at Boston this Christmas should make application to Jerome Cornfield, National Cancer Institute, Bethesda 14, Md., no later than September 15. A short abstract should accompany the request for presentation.

CHARLES PAINE WINSOR

Dr. Charles Paine Winsor, Assistant Professor of Biostatistics at the School of Hygiene and Public Health of the Johns Hopkins University, died suddenly on April 4. He had been in apparent good health and was stricken while spending an evening with a group of friends playing the Japanese game "Go."

Dr. Winsor was a fellow of the American Statistical Association and of the I. M. S. and was active in the Biometrics Section of the ASA and in the Biometric Society.

His formal training which was quite diversified and his wide reading and interests made him a real "scientific generalist." After receiving his Bachelor of Arts degree from Harvard in 1917, he served in the Army and then returned to Harvard receiving his Bachelor of Science degree in 1921 in the field of engineering. For six years he worked in electrical engineering and then, developing an interest in biology, he became associated with the late Raymond Pearl at the Institute of Biological Research at Hopkins. This association led his turning to graduate training in physiology, and he received his doctorate in this field from Harvard in 1935, working on the physiology of the eye.

In 1938 he went to Iowa State College as an assistant professor of mathematics, and was associated again with the application of mathematics to biological problems. In 1942 he received an appointment in the Department of Biostatistics at Johns Hopkins but deferred acceptance until the close of the war in order to work as an operations analyst for the National Defense Research Committee at Princeton University.

All who have ever been associated with Dr. Winsor were aware of his unusual quality of mind. Interested in any new problem, he was quick to grasp its fundamentals and to map out an approach to its solution. He also had a real feel for data and for the factors that made them good or bad. He was a very stimulating person and was at his best in informal chats with staff and graduate students. His publications include both technical papers and statistical applications to biology but they by no means represent the scope of his interests. Only through day to day contact with him could one get an appreciation of the breadth of his information and of the originality of his mind.

LOWELL J. REED, Baltimore, Md.

ASA Sponsors Joint Sessions at the Annual Meeting of the American Sociological Society

Wednesday, September 5, 10:00 A.M. Application of Mathematical Thinking to Sociology

Chairman, Frederick F. Stephan, Princeton University.

Panel members to be announced.

Thursday, September 6, 1:30 P.M. Sampling in Social Structures

Chairman, Harold Guetzkow, Carnegie Institute of Technology.

Symposium:

Harry Alpert, Bureau of the Budget.

W. W. Cooper and David Rosenblat, Carnegie Institute of Technology.

D. B. Hertz and S. B. Lattauer, Columbia University.

Paul F. Lazarsfeld, Columbia University.

Frederick F. Stephan, Princeton University.

NOMINATIONS—Continued

Vice-President

WALTER HOADLEY, Economist, Armstrong Cork Company, Lancaster Pennsylvania; formerly Senior Economist at the Federal Reserve Bank of Chicago; business and economic statistics; past president, Chicago Chapter, ASA; Chairman of the Section Committee on Business and Economic Statistics.

DAVID F. VOTAW, JR., Department of Mathematics, Yale University, New Haven, Conn.; mathematical statistics and sampling design; member Connecticut Chapter Executive Council, 1948-51; editorial collaborator, *Journal of the ASA*, 1951.

Director

IRVING LORGE, Institute of Psychological Research, Teachers College, Columbia University, New York City; educational statistics; Fellow of the Association; chairman of the Section on Educational Statistics of the New York City Chapter; member Publications Committee, 1948; Representative of the Advisory Board of the American Yearbook, 1950; Annual Meeting Program Committee, 1950.

M. I. GERSHENSON, Chief, Division of Labor Statistics and Research, California Department of Industrial Relations, San Francisco, California; social and economic statistics; member of the Council, 1949-51; past president, San Francisco Chapter; Chairman of the Pacific Coast Committee on Social Statistics of the Social Science Research Council; Representative to the American Standards Association Committee on Methods of Compiling Industrial Accident Statistics; Committee on Data Sources, 1950; Western Regional Representative, 1949-50.

HOWARD L. JONES, Statistician, Illinois Bell Telephone Company, Chicago, Illinois; quality control and economic statistics; member of the Council, 1949-51; past president of the Chicago Chapter.

WILLIAM R. LEONARD, Director, Statistical Office of the United Nations, New York City; international statistics; Fellow of the Association; formerly Assistant Director of the Division of Statistical Standards of the U. S. Bureau of the Budget.

WALTER F. WILLCOX CELEBRATES 90th BIRTHDAY

On March 22nd the many friends in Cornell University of Dr. Walter F. Willcox celebrated his 90th birthday with a dinner which was tendered to him at the faculty club in Statler Hall, the new headquarters of the School of Hotel Administration. Among the distinguished guests from Ithaca were President Emeritus Edmond Ezra Day and Dr. Liberty Hyde Bailey, the noted botanist, now enjoying good health at the age of 93. Those who attended from away included two scholars, William R. Leonard, Director of the Statistical Office of the United Nations, and Frank Notestein, Director of the Office of Population Research in the School of Public and International Affairs at Princeton, both of whom started their work in statistics under Professor Willcox. Two diplomats, Hu Shih and Sao-ke Alfred Sze, who had been undergraduates in Professor Willcox's classes, Justice Frankfurter of the Supreme Court, the Director of the London School of Economics, A. M. Carr-Saunders and several other European friends were among those who sent letters of congratulation and helped to make it a notable occasion.

Professor Morris Bishop presided and made an opening address. Brief speeches were then made by Romeyn Berry, Cornell '04, noted free lance commentator and writer on things Cornelian, Dexter S. Kimball, Emeritus Professor of Mechanical Engineering, and Professor Willcox. Mr. Berry reminisced about his early days at Cornell and the old Faculty of which Professor Willcox had so long been a member. It was a colorful group of men to which Mr. Berry paid kindly homage while noting also some of their lovable human qualities. Professor Kimball spoke of his long friendship with Dr. Willcox and recounted his eminence as a scholar and scientist, his influence as a citizen of Ithaca and his keen interest in matters national and international. On behalf of the assembled friends he then presented Dr. Willcox with a handsome desk clock.

In response, Dr. Willcox read a scholarly address about the international situation entitled "The Disunited Nations: A Novel Experiment in the Balance of Power." He also spoke of his long life at Cornell and of interesting faculty friends he had known in the previous sixty years. The occasion thus became for many of the guests a reunion of old-timers.

To have lived for ninety years is an accomplishment; to have lived so long and at the end to be hale and hearty, interested in all current events and a productive scholar makes a remarkable record. But he is a remarkable man; may he long be with us.

DEXTER S. KIMBALL



CULBERT LANEY, a Navy Department Statistician and father of four children has been chosen the "Ideal Father of 1951" in a competition conducted by The Washington Post. Mr. Laney is Head of the Fundamental Analysis and Future Programs Unit of the Bureau of Aeronautics of the Department of the Navy. He prefers, however, to be known simply as a "Mathematical Statistician."

The Los Angeles Chapter Reactivated

A group of Association members met recently in Los Angeles to revive Association activities. Officers elected for the 1951-52 term include: John C. McKee, President; William A. Craig, Vice-President; Hugh H. Brown, Treasurer and Donald A. Smith, Secretary. The next meeting of the chapter will be held at the University of Southern California about August 16, and thereafter on the third Thursday of each month. Details of meetings may be obtained from the Secretary, Donald A. Smith, 1953 Redesdale, Los Angeles 15; Telephone—Olympia 7019.

Section on Training

Membership of the Section Committee on the Training of Statisticians: Rutledge Vining, Chairman; George E. Nicholson, Secretary; Helen M. Walker, William G. Madow, Alexander M. Mood, Howard L. Jones and Harry V. Roberts.

The Normal Blood Pressure Range and its Clinical Implications

By Arthur M. Master, M.D., Louis I. Dublin, Ph.D.
and Herbert H. Marks, A.B.

There is an urgent need for a better definition of the limits of normal blood pressure. Good standards would have widespread application in clinical, insurance, industrial and military medicine. Since blood pressure readings are customarily only approximations, exact statistics cannot be derived from available records. We believe, however, that the data given in this report afford a useful measure of the limits of normal blood pressure for both men and women in the age groups from 16 to 65.

The method of approaching this problem followed in this paper, is a statistical definition based on the distribution of blood pressure readings around the mean, according to sex and age. This takes cognizance of the fundamental property of the data of most measurable human structures or characteristics, namely, that their frequency distribution yields a fairly normal curve. With some limitations this holds true for blood pressure readings. Consequently, the customary statistical tests of significance can be applied to deviations from the mean values. Obviously, since there is no sharp dividing line between clearly normal and clearly abnormal levels of blood pressure, the limits of normal blood pressure, even by a statistical definition, must be arbitrary. Certainly we assume that any reading within one standard deviation of the mean is probably within the normal range, and it is not unreasonable to extend this normal range to cover 80 per cent of the observations, that is, 40 per cent on either side of the mean. On the other hand, any blood pressure reading departing 20 or more from the mean is probably abnormal. For practical use the range of 5 per cent at the upper and lower ends of the curve may be taken as constituting this abnormal group. The area between the limits of the normal and the limits of the probably abnormal would thus constitute a narrow borderline zone.

The Data

The data which form the basis of the present study were obtained from industrial plants in various sections of the country. The majority of persons included were at work, but the study also included those applying for employment, whether or not they were rejected. The study covered executive, clerical and manual workers, both skilled and unskilled, although no attempt was made to identify specific occupations. Likewise, records did not show whether the individuals were white or Negro, but the great majority were of the white race. Altogether, unselected records of about 74,000 persons in sixteen industrial plants and army airfields (civilian personnel only) were collected. Because of the large volume of material, random samples were taken in order that there should be at least 500 observations for men and for women in each age group. In a few instances, however, when the number available was less than 500, all the cases

In view of the almost universal blood pressure phobia which has been created because of the large number of persons labelled as "hypertensive," this statistical study of the normal blood pressure range is presented for its interest to statisticians and non-statisticians alike.

This article is an abridgment of a paper read before the Scientific Assembly at the Clinical Session of the American Medical Association on December 8, 1949 in Washington, D. C. and prepared by agreement with the authors. The Journal of the American Medical Association has given permission to use some of the material published in the August 26, 1950 issue, Volume 143.

were used. The data tabulated cover 15,706 persons (7,722 men and 7,984 women) in eleven of the installations. The age range was 16 to 65 years. The volume of data for ages over 65 years was so small that this part of the material was omitted. Samples were taken at ages 16, 17, 18 and 19, in order to determine, particularly in males, the variation at individual ages during the period before full growth had been attained.

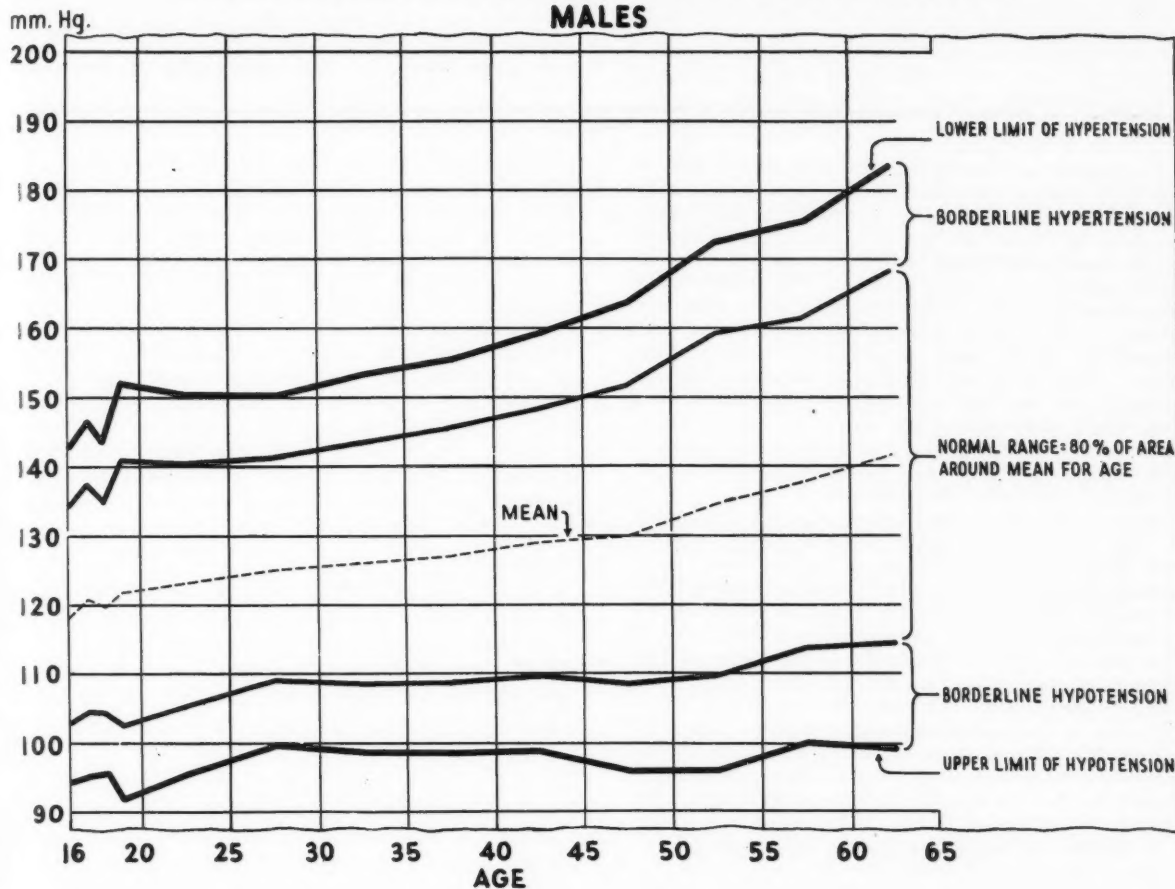
The men in this study are more representative of the male population than are the women of the female population. The fact that these data were collected during wartime causes little distortion in the material because hypertension and hypotension were relatively unimportant as causes of rejection for service. The sample of men includes both married and single men approximately in the same proportion as are found in the general population, except at the military ages, and the occupational distribution is presumably similar to that of the urban population. The sample of women, as is characteristic of any group of working women, consists predominantly of single or childless women and there is a heavy concentration in clerical jobs. This type of bias in the women's group appears in most of the age range and is probably most pronounced after the age of 45. It is doubtful whether this bias seriously affects the value of the results. Furthermore, during the war many married women were employed.

The Analysis of the Data

The figure shows the application of our proposed procedure, based on the statistical definition, to the determination of the systolic limits among men. The wide diagonal area in the middle shows the readings that may be taken fairly definitely as within the normal range in successive age groups. The heavier lines at the top and the bottom indicate readings according to age that are probably abnormal, and the zones in between are the borderline hypertensive and hypotensive zones. This graph is based on the actual computations. However, since blood pressure readings themselves are not so exact, some degree of modification of the computed values is necessary. This has been carried out in a table which shows the normal

RANGE OF NORMAL SYSTOLIC PRESSURE AND LIMITS OF HYPERTENSION AND HYPOTENSION

MALES



range of systolic and diastolic pressure by sex and age and the limits beyond which readings are probably abnormal, both on the high and the low side (see table). Again, we would stress the point of view that persons with readings falling outside the upper limits of hypotension and the lower limits of hypertension should not, for this sole reason, be labeled hypotensive or hypertensive, but the probability that they are is extremely high.

Blood pressure readings which fall in the normal range should be considered entirely normal, but those in the intermediate zone between this normal range and lower limit of hypertension are best viewed as probably normal but should receive a thorough study before final decision is reached.

It is essential in evaluating blood pressure readings that one use our tables sensibly and not too literally. As we have had occasion to point out in a previous paper, the whole clinical picture must be taken into account. Just as dependence for diagnosis on a single observation or test may be a dangerous practice in clinical medicine, so the evaluation of the blood

pressure reading without correlation with the entire examination of the patient is unsound.

The problem of high blood pressure is omnipresent. Both physicians and lay persons consider it important. The physician can easily instill fear in the patient with his blood pressure reading. The number of patients who appear in offices of internists or cardiologists simply because they have been told that they have high blood pressure is so large that the use of the expression "blood pressure phobia" is genuinely warranted.

Although the life insurance studies show an increased mortality with even relatively moderate rises in blood pressure above the average with age and must be used as a guide for life insurance purposes, the significance of the results for the clinician may be greatly misunderstood. These observations do not mean that all or even the majority of persons with elevated blood pressure will suffer a diminution of longevity but simply that an undue proportion of them will, and consequently the average longevity for the group is lowered.

New Undergraduate Degree in Statistics at the University of Missouri

Harry P. Hartkemeier
University of Missouri

A program of training in the field of statistics at the University of Missouri is not new; it has been in operation for 21 years. However, a new degree, Bachelor of Science in Statistics, has been established by the Board of Curators of the University of Missouri and it will be available to students who complete the requirements of the curriculum in statistics after September 1, 1951. I believe that this is the only such degree which has been established in the United States. The Graduate Faculty of the University of Missouri has awarded the degree of Master of Arts with designation and major in statistics and Master of Science with designation and major in statistics. The degree of Doctor of Philosophy with a major in statistics has also been awarded.

When I began teaching statistics at the University of Missouri 21 years ago I discovered very quickly that there were serious disadvantages in the plan of having several courses in mathematics as prerequisites of the introductory course in statistics. The courses in mathematics were of the traditional old-fashioned type that were geared primarily to the needs of the physical sciences and engineering; no mention was made of the possible applications of mathematics in the social sciences, statistics, and business. The attitude of the Chairman of the Department of Mathematics was made very clear shortly after I joined the faculty by his statement during a meeting of the Graduate Faculty that "There is no field of statistics—it is nothing but an application of mathematics."

The mathematics prerequisites of the introductory course in statistics discouraged students who might have become interested in statistics. The courses in mathematics also prevented students from discovering the interesting field of statistics until it was too late to do much about it. Statistics was not taught in the high schools and students entering the university did not know what the science of statistics meant. Their dislike for the type of mathematics courses available made them postpone mathematics as long as possible—until they *had* to take the courses in mathematics in order to take the one required course in statistics just before graduation. Students came to me during the last semester of their senior year and after graduation to say that if they had learned early enough in their college or university career what an interesting field statistics is they would have specialized in it, and to express their great regret that they did not discover it until it was too late. This led me to the conclusion that what was needed was a beginning course in statistics for freshmen, without any prerequisites. This would permit the students to discover if they liked the field of statistics at a time when it was still possible to do something about it and take the mathematics courses necessary. In this frame

of mind they would take even the unsatisfactory courses in mathematics available because they now knew why they were taking them and could look especially for the parts of the mathematics courses that would be most useful to them.

The Faculty of the School of Business and Public Administration and the Faculty of the College of Arts and Science agreed to allow me to give such a course, and it turned out to be very successful. The enrollment grew from 30 to over 600 students a semester. During the peak period there were 12 lecture sections and 32 laboratory sections each semester in this course, which is now identified in the catalog as Statistics 1, Elementary Statistical Analysis. It is required of all students who intend to enter the School of Business and Public Administration, but only about one-half of the enrollment is made up of such students. The other half of the students elect the course as a part of their work in other divisions of the University of Missouri. During the period of peak enrollment the Statistics Laboratory was kept open under the supervision of instructors and graduate assistants in statistics for 7:30 A. M. until 10:00 P. M. five days a week and from 7:30 A. M. until 5:30 P. M. on Saturday. The students wore out a great deal of laboratory equipment during this period.

After I had been teaching this course or supervising the teaching of sections of this course by a number of instructors for quite a few years, I was very pleased to have such a course recommended by a committee that made a four-year study of the problem of training statisticians at the request of the National Research Council, by a Committee of the American Statistical Association, by a Committee of the Institute of Mathematical Statistics, and more recently, by the retiring President of the American Statistical Association in the Journal for March, 1951. So far as I can tell, this course at the University of Missouri was the first freshman course in statistics taught in the United States and I believe that it has had the largest enrollment among introductory courses. There are now 12 undergraduate courses in statistics involving 35 semester hours of credit and 7 graduate courses in statistics involving 31 semester hours of credit at the University of Missouri, not counting such courses as educational statistics, social statistics, agricultural statistics, psychological statistics, etc.

The undergraduate curriculum in statistics in its present form is shown below. It may be easy for many of you to find aspects of it which might be improved, but it represents a number of compromises between the statistics staff and the staffs interested in protecting the vested interests of the "older" traditional fields. There have been many difficulties encountered in establishing this new type of training, and the resistance to the establishment of anything

new has yielded very slowly and grudgingly. I believe that the introduction of undergraduate training in the science of statistics has been the most important development in the educational world during the present generation. The principal reason why its introduction has been delayed lies in the fact that most of the educational administrators received their training at a time when there was little or no training in statistics, but they cannot prevent the necessary educational progress.

Program in Statistics at the University of Missouri

Courses Required During the Freshman and Sophomore Years

	Credit Hours
English Composition	6
Elementary Statistical Analysis	4
College Mathematics	3
American Government	5
American History	5
Elementary Accounting	4
General Economics	5

Curriculum VI. Statistics

For students preparing to become statistical analysts, directors of research, quality control and inspection supervisors, supervisors of punch-card divisions, and junior statisticians for the United States Census Bureau, Bureau of Labor Statistics, Department of Commerce, Department of Agriculture, Weather Bureau Offices, Treasury Offices, F. B. I., various state and municipal offices, etc.

Students who are considering statistics as their field of specialization should take Statistics I during the freshman year in order to discover if they like this type of work while there is still time to plan the best type of program.

Students who plan to concentrate in optional group "e" below should take Mathematics 9 and 10 during the freshman and sophomore years in addition to the other requirements.

Required Courses	Credit Hours
Index Numbers	2
Punch-Card Methods	3
Multivariate Analysis	3
Secular Trend	3
Periodic Variation	3
Univariate Analysis	3

OPTIONS

At least 28 hours from the following groups of courses which are suggested areas of concentration.

a. INDUSTRIAL STATISTICS

	Credit Hours
Quality Control	3
Intermediate Accounting	3
Industrial Accounting	3
Industrial Management	3
Labor Problems	5

b. MARKETING STATISTICS

Principles of Marketing	3
Marketing Management	4
Retailing	4
Foreign Trade	3
Market Analysis	3
Sales Control	2

c. FINANCE STATISTICS

Corporation Finance	3
Public Revenues	4
Money, Credit and Banking	4
Investments	3
Business Fluctuations	3

d. GOVERNMENTAL STATISTICS

Principles of Public Administration	4
Administrative Regulation of Business	3
Population Trends	3
Social Insurance	2
Transportation	3
Governmental Accounting & Auditing	3

e. THEORETICAL STATISTICS

Analytical Geometry	5
Calculus I	5
Calculus II	5
Additional Mathematics courses numbered above 200 or additional Statistics courses	5

Electives (professional courses acceptable in this curriculum) sufficient to complete sixty hours and sixty points required by this school. The electives may be chosen from Accounting, Economics and Business, and the following specific courses in other departments:

Engineering Drawing	3
Descriptive Geometry	3
Elements of Electrical Engineering or	5
Fundamentals of Electrical Machinery	3

Association Activities

1950 Report of the Census Advisory Committee of the American Statistical Association

The Census Advisory Committee of the American Statistical Association met twice during the past year, once on April 28 and 29 and again on December 4 and 5. Both meetings were held at the Bureau of the Census and the various programs were discussed at length with officials of that Bureau.

Seventeenth Decennial Census. Discussions of problems of the 1950 Censuses of Population, Housing, and Agriculture played a significant role in this year's meetings. While the detailed examination of tabulation plans and other materials was the concern of a number of technical advisory committees, this Committee was requested to review the findings and, in a number of instances, to advise on controversial points which arose out of discussions and conflicting recommendations.

Two aspects of the 1950 Decennial Census program were of especial interest to this Committee, namely the evaluation of census procedures and results and the monograph program.

Evaluation of Census Procedures and Results.—In connection with the enumeration for 1950, the Bureau conducted a number of experiments designed to furnish information on alternative data collecting procedures under actual field conditions. Also, as part of the data collection program, the Bureau of the Census is conducting a post-enumeration survey which will make available extensive information not only on the extent of coverage of the Census but also on the quality of the enumerated results.

The evaluation of census procedures through the variation in enumeration techniques in "experimental" areas and the evaluation of census results through the post-enumeration survey are regarded by this Committee as highly significant developments which lead to a better understanding and therefore more efficient use of statistical data. Similar projects have been undertaken in connection with other recent major censuses conducted by the Bureau.

Monograph Program.—The Census Advisory Committee has always taken an interest in having special analytical studies made using Census results and developing them beyond the point of reporting in the basic volumes. The last two decades have seen the proposed monograph programs limited by depression and by conditions of national emergency. This Committee has urged that funds be allocated and reserved for appropriate analytical studies which would provide highly beneficial results in making data more

usable in return for the relatively small financial investment required for these studies.

Officials of the Bureau have been cooperative in planning for such reports. In addition, the Social Science Research Council has established a Committee on Census Monographs to work with the Bureau in planning a series of subject-matter reports; the Housing Research Committee of the Council is considering monographs on housing. Barring developments which may seriously affect the financial resources of the Bureau or which may require the channeling of effort into other activities, it appears that a series of monographs based on the results of the 1950 Censuses is a definite possibility.

Interagency Comparability of Establishment Statistics.—Another area in which there are highly interesting developments is the coordination of statistical reporting between agencies, especially in areas involving returns from manufacturing and business concerns. A major step in applying the Standard Industry Classification to each plant is being taken in the assignment of identical codes to the same manufacturing establishment in both the Census and Social Security files. The extension of this identical identification to other agencies increases the possibilities of comparable statistics being available for the various series involving reports for manufacturing plants. The extension of this procedure to areas other than manufacturing is also being considered. In applying this development, the Bureau of the Census has been taking a leading role.

Other Topics.—The Committee also reviewed plans for publishing the results of the Census of Business, issues involved in the current industry and business programs, the initial plans for the Census of Governments, and other topics. The importance of basic statistical information as furnished by the Bureau of the Census was made apparent by developments of the past year during which problems of national defense were again brought to the fore. The availability of general-purpose statistics and the services of an agency specializing in statistics collection and processing are, without question, strong points in the system of statistical intelligence in the United States.

Report of the Representative of the ASA on the Board of Directors of the National Bureau of Economic Research

The publishing schedule of the National Bureau for 1950 and early 1951 has been unusually heavy. A number of studies, completed during the year, are

represented by books published or in press by the end of the year. Five books were published during the year:

Taxable and Business Income, by Dan T. Smith and J. Keith Butters (Studies in Fiscal Policy, No. 2). Part I of this volume analyzes the reasons for divergence between net income as reported by business firms for tax purposes and net income as determined for business purposes. Part II is a detailed statistical analysis of the magnitude and source of the divergence between taxable and business income for firms classified by industry, asset size, etc., 1929-37.

Studies in Income and Wealth, Volume Twelve, by Conference on Research in Income and Wealth. This volume contains a series of closely related papers on the measurement of national wealth.

Urban Mortgage Lending by Life Insurance Companies, By R. J. Saulnier. This monograph describes the urban mortgage market served by life insurance companies and examines in detail the record of investment experience 1920-46, and the costs and returns on mortgage loan holdings 1945-47. It is the first of the reports to be issued in the series of studies dealing with urban real estate financing.

The Impact of Government on Real Estate Finance in the United States, by Miles Colean (Studies in Real Estate Financing, No. 2). This study describes the ways in which government influences the financing of real estate activity and evaluates the significance of these influences on the flow of funds into real estate investment.

Inventories and Business Cycles, with Special Reference to Manufacturers' Inventories, by Moses Abramovitz (Studies in Business Cycles, No. 4). This study describes the behavior of the volume of manufacturers' stocks and their rate of accumulation during business cycles, and develops a reasoned account of that behavior through an analysis of the diverse fluctuations in different types of inventory.

Occasional Papers published in 1950 included the following:

Occasional Paper 31, Statistical Indicators of Cyclical Revivals and Recessions, by Geoffrey H. Moore, presents a selection of statistical series screened from the National Bureau's large collection measuring many different kinds of business activity during periods since 1854. It shows that the behavior of these series in successive periods of business expansion and contraction has been relatively systematic, and analyzes their potential usefulness as indicators of revivals and recessions.

Occasional Paper 32, Cyclical Diversities in the Fortunes of Industrial Corporations, by Thor Hultgren, presents the findings in a study of profits over the period since 1920. It shows that the number of com-

panies with improving profits begins to diminish before the end of a general business expansion, and to increase before the end of a contraction.

Occasional Paper 33, Employment and Compensation in Education, by George J. Stigler, measures and explains the trend in the number of teachers and their compensation in the United States. It shows that the powerful yearning for formal education has given rise to a very large industry, employing a million and a half persons, and that until recently teachers have been the most numerous peacetime employees of government, and education has been its most expensive peacetime function.

Occasional Paper 34, Behavior of Wage Rates during Business Cycles, by Daniel Creamer, starts by noting the proposition that unevenness in the rate of change in the prices of goods and services is a partial explanation of the changing levels of business activity. Within this framework it analyzes the cyclical movements in wage rates. It compares cyclical turning points in wage rates with turning points in hourly earnings during the two decades between World Wars I and II, and finds that turns in both lag behind changes in business activity and employment.

Occasional Paper 35, Shares of Upper Income Groups in Income and Savings, by Simon Kuznets, presents the findings of a study of the distribution of income by size. It shows that the average income shares of upper income groups during the years between the two world wars were: top 1 percent of the population, 15 percent of income; top 5 percent of population, 30 percent of income. These shares have declined in recent years (to 1948) by about one-third to four-tenths. Much additional information on the income distribution is given.

Five volumes were in press at the end of 1950. Wesley Mitchell's eagerly awaited report on *What Happens during Business Cycles*, edited and prepared for publication by Arthur F. Burns after Mitchell's death, will be the first off the press. The book explains the National Bureau's objectives in undertaking its comprehensive investigation of business cycles; sets forth its basic concepts and methods of measurement; describes and explains the great variety of cyclical fluctuations characteristic of economic activities; and closes with a composite picture of business cycles drawn on the basis of empirical observations that cover every branch of economic life.

Four other volumes are to be released early in 1951. These are:

Studies in Income and Wealth, Volume Thirteen, by Conference on Research in Income and Wealth:

The Transportation Industries, 1889-1946: A Study of Output, Employment and Productivity, by Harold Barger;

Nature and Tax Treatment of Capital Gains and Losses, by Lawrence H. Seltzer, with the assistance of Selma F. Goldsmith and M. Slade Kendrick;

Deterioration in the Quality of Foreign Bonds Issued in the United States, 1920-30, by Ilse Mintz.

Continuing studies of the staff of the National Bureau deal with business cycles, income and money flow, employment, productivity and the labor market, prices, agricultural finance, corporate finance, real estate finance, and public finance.

New studies have been initiated in several fields. These include a broad study of the capital requirements of the American economy, which was started in 1949-50 under the direction of Simon Kuznets. Its scope may be indicated by the leading questions it will attempt to answer: What has been the course of capital requirements in recent decades and what factors have determined it? From what sources have our capital requirements been financed, and what factors have determined the use of, and choice among, sources of funds? What is the current and probable future course of capital requirements and their financing? The Life Insurance Association of America has voted a grant of funds to the National Bureau to finance the study.

New research has also been initiated in the field of consumption. Lawrence Klein is in charge of a study of consumption patterns, which will attempt to analyze the influence of income, asset holdings, age, and other factors on consumer spending and saving. The study is being made jointly with the Survey Research Center of the University of Michigan, and will be devoted largely to an analysis of the rich materials on consumer behavior compiled in the last few years by that institution.

Plans for fiscal research have been further developed, and some new work has been started. The statistical history of the personal income tax, on which Lawrence H. Seltzer has been working, was broadened by the addition of a parallel study of the corporate income tax by Sergei Dobrovolsky. Daniel Holland is attempting to link statistically the corporate and personal income taxes by fitting corporate earnings into a personal distribution of taxable income. George E. Lent is making a study of the changing volume, distribution of ownership, and economic effects of tax exempt securities. John M. Firestone has begun a study of Federal revenues in business cycles.

Plans for a study of government lending, loan guarantees, and loan insurance as the next project to be undertaken in finance were completed in the autumn of 1950. It will be undertaken with the support of a grant of funds from the Association of Reserve City Bankers.

The reorganization of the Universities-National

Bureau Committee, looking toward the inclusion of all universities at which graduate study and research in economics are developed, as well as representatives of government agencies, was effected during the year. The first meeting of the Committee as reorganized was held in June 1950.

The second special conference, on research in business cycles, under the auspices of the Committee was held on November 25-27, 1949, and the third, on research in business finance, was held June 19-21, 1950. Papers prepared for these conferences are being revised and prepared for publication.

Thomas R. Atkinson, University of Wisconsin; John M. Firestone, College of the City of New York, and Penelope C. Hartland, Brown University, were appointed research associates for 1950-51. Lawrence R. Klein continued as research associate under a joint arrangement with the Survey Research Center of the University of Michigan.

The National Bureau suffered the loss of two members of the Board of Directors during the year. Robert B. Warren, Director by appointment of the Institute for Advanced Study, died March 23, 1950, and Warren C. Waite, Director by appointment of the American Farm Economic Association, died November 11, 1950.

At the 1950 Annual Meeting of the Board, Boris Shishkin, Director by appointment of the American Federation of Labor, was elected Chairman of the Board; Harry Scherman, Director at Large, was elected President; and C. Canby Balderston, Director by appointment of the University of Pennsylvania, was elected Vice President.

Respectfully submitted,

FREDERICK C. MILLS.

This report was given verbally by Alfred N. Watson, Chairman of the Public Relations Committee, at the Annual Business Meeting of the Association held at the Congress Hotel, Chicago, Ill., on December 28, 1950.

LADIES AND GENTLEMEN:

It is a real privilege for me to have a few moments here to discuss public relations with you. The American Statistical Association has undertaken to place new emphasis on this subject because of the belief of its officers that by so doing, the statistical profession can make a more effective contribution and promote its objectives more easily than would otherwise be the case.

Briefly, here is the thinking that lies behind the program. It goes something like this:

Statistics is a pretty important profession. It has something to contribute to these troubled times that may make it easier for everyone to bear the burden. Many of our group have joined the United Nations

to help that organization achieve world peace. Others have joined the Defense Department—just in case.

Quality control, experimental design, mathematical models, enumeration methods—the statistical profession touches more human activities than almost any other. And what common problem does each of us have regardless of his field of application? Just this: He deals primarily with non-statisticians. Non-statisticians use and act upon the results of our work, approve our budgets and, generally, determine the effectiveness of our work.

This, I believe, is the clue to a public relations program for a statistical association. We are concerned with non-statisticians, what they think of our profession, how they accept and use our work and the opportunities they give us to demonstrate the value of the statistical approach to their problems. In short, we seek to create the type of work climate that makes our work more effective and useful. We, as statisticians, can make some progress alone. But if we have both the confidence and willing cooperation of non-statisticians, we can progress more rapidly.

What do non-statisticians know about us? Ask some of your non-statistical colleagues the next time you are at lunch what they think a statistician does for a living. I have tried this—and I can assure you that the survey is more likely to contribute to your knowledge than it does to a sense of complacency or well being. The plain fact is that our colleagues do have opinions about us—we can't help that, but we can help to clarify these opinions and provide them with facts, so that their opinions will mirror the real values of our profession.

How can we do this? In much the same way that other organizations have approached the problem. First, have a good product. Second, protect your investment of time, money and hard work by a small expenditure of effort of making your work better known among those whose opinions are important to you.

Does this include professional colleagues whose experiments need statistical design? Certainly! Does it include plant managers who could benefit by quality control? Of course! Does it include business men who should buy market surveys based upon probability selection of respondents selection of respondents. Surely! Should it include school administrators who have final approval of a course in statistical methods at high school levels? Yes!

The circle is getting wider. Already the non-statisticians whose opinion about us we value outnumber us twenty to one.

Finally, should our circle include the general public—that great non-statistical group that thinks a standard error is just as bad as any other kind? Before we decide to exclude this group, let me remind you of one additional fact. The general public knows practically nothing about the technical aspects of the atomic bomb. Yet, that same group controls its use, furnishes the funds for its continued improvement and casts into jail those technical members that use their knowledge in a way which the non-technicians feel is contrary to their interests.

Yes, I know the analogy is not perfect, but whether we like it or not, the non-statisticians determine the rate of progress of our profession to a considerable extent. It only makes sense that we take out some insurance that their influence will be exerted in the right direction.

Our goal, then, is systematically to inform non-statisticians of our work in such a way that they become willing and cooperative partners in furthering the progress of our profession. There are a number of ways to do this.

In one area, let me illustrate what public relations has done in connection with the conference. In Parlor G of this hotel, De Ver Sholes has established a press room. If you have not done so, you are invited to visit it. Advance contacts were made with wire services, local papers, and local bureaus, inviting them to use the facilities of this room. Every effort was made to facilitate their coverage of our 55 sessions. Mimeographed releases were prepared for each session, so that a busy journalist could select those of primary interest to attend, yet have something available to say about each. Your complete texts were systematically arranged in order of time of release when the speech was to be given. Releases about each speaker and his paper were sent to the principal newspapers in the area of his residence. Mr. Shole's excellent work has provided the opportunity for high-caliber informational coverage of our meeting.

In another area, your public relations committee receives advance galley proofs of your articles in the Journal. Those which are of wide interest and which are relatively non-technical are sent to skilled journalists who prepare a story for simultaneous release with the Journal. This goes not only to the newspapers and wire services, and radio news commentators, but to selected business and trade publications, whose readers may be concerned with the problem. For example, if it deals with sample selection of survey respondents, it should reach readers of *Tide*, *Business Week*, *Printers Ink*, *Advertising & Selling* and other important publications. When the Research Director tells the Advertising Manager he needs probability methods of respondent selections—we have made it a little more likely that the Advertising Manager has at least heard of the critter before—and in a favorable way.

If the paper is highly technical, we send it to the public relations man of the author's institution and often to a third party who has a reputation for both understanding the technical terms and translating their importance into lay language. We ask them to sit down together and prepare a statement that is satisfactory to each. The tools he uses are of primary importance only to the statistician. The conclusions he reaches are important to every intelligent citizen.

Yes, public relations is always with us. With the cooperation of each member of our profession, we can, at relatively small cost, channel it to help us. It seems like a small insurance premium to pay for such valuable potential goals. If you will just continue the fine support you gave the committee this year, it will try its best to serve you better next year.

The Program of the Section on the Training of Statisticians

Towards the end of last year, a canvass of the ASA membership showed that almost a thousand members, or about one quarter, have declared their interest in the Section on the Training of Statisticians. The ground work for this Section was laid by a small group of interested members and the preparatory phase has now been completed.

At the last business meeting of the Section, held during the annual meeting of the Association in Chicago, the following broad program was suggested.

Suggested scope of the Section:

1. The Section, as originally conceived, is to operate in the broader area of training, not only in the field of education as customarily represented by universities, colleges and schools.

2. In order to perform its function efficiently, the Section should—

a. Locate and recognize important and critical problems as they are developing in the area of training of statisticians;

b. Inquire into these problems in order to arrive at their solution;

c. Suggest adequate ways and means to translate proffered solutions into operational terms and see to it that they find the broadest acceptance among those directly and indirectly involved in the process of producing statisticians and statistical skills.

Specific Functions of the Section:

1. *Promote Interest* in the objectives of the Section among the members of the Association and among other professional groups through—

a. Participation in the planning of the programs of annual and other—e.g., regional meetings.

b. Cooperation in the Association's publications programs—Journal, American Statistician, Monographs, Symposia, etc.

c. Establishing of closer relationships with other professional groups at home and abroad.

2. Inquire into the *demand* for statistical skills, educate the users of statisticians and of statistical methods and promote better understanding among them of the function of the statistician by:

a. Investigating "Product Requirements," e.g., studying job specifications for various types of statisticians.

b. Exploring job opportunities for statisticians, e.g., studying the "economic status" problem.

c. Demonstrating to the actual and potential employer of statisticians what the statistician can do for him.

3. Investigate the problem of the *supply* of statisticians to improve, where feasible, the "Production Process" through:

a. The study of teaching methods—examining course contents, curricula, statistical organizations in educational institutions, teaching aids, "gadgets," etc., and

b. Encouraging expansion of existing and development of new training facilities—participating in the development of industry and government training programs; setting up of internships; sponsoring summer institutes and the like.

4. Develop "Product Standards" and devise means toward enforcing them in exploring the complex question of:

a. Accrediting institutions of higher learning and

b. Certifying statisticians.

A program of this size and scope has, of course, to be appraised and approached carefully. Its implementation has to be developed step by step and will include the gradual developing of relationships with universities and colleges, with industry and government; it will have to rely to a considerable extent on the cooperation of the Association's members and of graduate students, and others who might be drawn into the various phases of this proposed exploration.

Those members of the Association who have expressed their interest in the work of the Section on the Training of Statisticians are invited to communicate with the Chairman of the Section concerning any aspect of the program in which they would like to participate.

RUTLEDGE VINING, *Chairman,*
Section on the Training of Statisticians.

University of Virginia,
Charlottesville, Virginia.

MORE NEWS

Sampling the Samplers

Some statisticians will have an opportunity to demonstrate proper behavior on the part of the sampling unit in a sampling survey of the economic status of members of the American Statistical Association which will be instituted within the next two months by Professor Zenon S. Malinowski of the University of Connecticut. The ASA is very much interested in this study and urges the members to cooperate with Professor Malinowski by returning his mail questionnaire promptly. The results of the survey will be published and made available to members of the Association.

University of Michigan Survey Research Center

The Survey Research Center of the University of Michigan sponsored a three-day conference for directors of field interviewing staffs at the Survey Research Center, Ann Arbor, Michigan, from March 22 to March 25. Approximately thirty-five conferees from research organizations in government agencies, private business and universities in the United States and Canada participated.

The conference was devoted to an intensive discussion of field interviewing problems. The agenda included such topics as selection of interviewers, training methods, instructions for interviewers, costs and budget control, response and refusal rates, field sampling methods and research in interviewing methodology.

Regional Meeting of the Econometric Society at Minneapolis

Minneapolis, September 4-7, 1951 (Jointly with the American Mathematical Society, the Mathematical Association of America and The Institute of Mathematical Statistics)

Full information concerning travel, registration, accommodations, etc. may be obtained by writing to The Econometric Society, University of Chicago, Chicago 37, Illinois.

The public is cordially invited to attend these sessions.

TUESDAY — SEPTEMBER 4, 1951

9:30 A.M.-NOON

(Nicholson Hall 207)

Chairman: O. H. Brownlee, University of Minnesota

Papers

Welfare Economics

I. M. D. Little, Trinity College, Oxford

An Alternative Approach to Welfare Economics

Clifford Hildreth, Cowles Commission for Research in Economics

A Mathematical Formulation of a Certain Aspect of a Space-Economy

Walter Isard, Harvard University

Informal Discussion

3:15-5:30 P. M.

(Nicholson Hall 211)

Symposium on the Theory of Games, Decision Problems, and Related Topics. Session I—Theory of Games

(Cosponsor: Institute of Mathematical Statistics)

Chairman: John von Neumann, Institute for Advanced Study

Discussion Olaf Helmer, The Rand Corporation

Leaders Samuel Karlin, California Institute of Technology and Princeton University

Discussants

G. B. Dantzig, U. S. Department of the Air Force

J. C. C. McKinsey, Stanford University

T. S. Motzkin, National Bureau of Standards

Howard Raiffa, University of Michigan

A. W. Tucker, Princeton University

WEDNESDAY — SEPTEMBER 5, 1951

9:30 A.M.-NOON

(Nicholson Hall 207)

(Cosponsor: Institute of Mathematical Statistics)

Round Table on Econometric Research in Agriculture

Chairman: Bruce D. Mudgett, University of Minnesota

Papers

Some Applications of Least-Squares Methods in Research in Agricultural Economics

R. L. Anderson, University of North Carolina

Some Production Functions Derived for Agriculture and Their Implications

E. O. Heady, Iowa State College

Statistical Estimates of the Demand for High Protein Feeds in the United States, 1920-1950

O. H. Brownlee, University of Minnesota

The Statistical Determination of the Demand for Meat

Burton L. French, University of Nebraska

Econometric Analysis of the Demands for Pork, Beef, and Poultry

Omar Wahby, Iowa State College

10:15 A.M.-12:30 P. M.

(Nicholson Hall 211)

Symposium on the Theory of Games, Decision Problems, and Related Topics. Session II—Statistical Decision Problems

(Cosponsor: Institute of Mathematical Statistics)

Chairman: Jacob Wolfowitz, Cornell University

Discussion David Blackwell, Stanford University

Leaders Charles M. Stein, University of Chicago

Discussants

Herman Chernoff, University of Illinois

Aryeh Dvoretzky, Hebrew University, Jerusalem

J. L. Hodges, University of California, Berkeley

Jerzy Neyman, University of California, Berkeley

M. P. Peisakoff, The Rand Corporation

THURSDAY — SEPTEMBER 6, 1951

9:30 A.M.-NOON

(Nicholson Hall 207)

Chairman: F. C. Boddy, University of Minnesota

Papers

Inventories

Thomson M. Whitin, Princeton University

The Classical Tax-Subsidy Problem

Gerard Debreu, Cowles Commission for Research in Economics

Efficient Accumulation of Capital

Edmond Malinvaud, Institut National de la Statistique

et des Etudes Economiques

Informal discussion

10:15 A.M.-NOON

(Nicholson Hall 211)

Symposium on Probability and Statistical Inference

(Cosponsor: Institute of Mathematical Statistics)

Chairman: Leo Katz, Michigan State College

Papers

Inductive Behavior

J. Neyman, University of California, Berkeley

Purposes of Fiducial Inference

J. Tukey, Princeton University

Discussants

L. Hurwicz, University of Illinois

G. Tintner, Iowa State College

2:00-3:15 P. M.

(Nicholson Hall 211)

Rietz Memorial Lecture

(Cosponsor: Institute of Mathematical Statistics)

Paper

The Behavior of Standard Statistical Tests under Non-standard Conditions

Harold Hotelling, University of North Carolina

3:30-5:45 P. M.

(Nicholson Hall 211)

Symposium on the Theory of Games, Decision Problems, and Related Topics. Session III—Decision-Making and Theory of Organization

Chairman: T. C. Koopmans, Cowles Commission for Research in Economics

Discussion M. M. Flood, The RAND Corporation

Leaders L. Hurwicz, University of Illinois

Discussants

Norman Dalkey, Naval Air Development Center

J. F. Nash, Princeton University

H. A. Simon, Carnegie Institute of Technology

C. B. Tompkins, George Washington University

FRIDAY — SEPTEMBER 7, 1951

9:00-10:15 A. M.

(Nicholson Hall 207)

Chairman: To be announced

Papers

Brand Preferences and Brand Mobility among Consumers' Goods

Howard H. Hines, Iowa State College

Models of Transportation and Location

Martin J. Beckmann, University of Chicago

Informal discussion

10:30 A.M.-12:15 P. M.

(Nicholson Hall 211)

Wald Memorial Lecture

(Cosponsor: Institute of Mathematical Statistics)

1:30-3:45 P. M.

(Nicholson Hall 207)

Chairman: To be announced

Economic Data and Their Reliability

C. B. Tompkins, George Washington University

Index Numbers

Bruce D. Mudgett, University of Minnesota

The Revision of the Bureau of Labor Statistics Price Index

Abner Hurwicz, Bureau of Labor Statistics

Applications of Some Statistical Techniques to Farm Property Assessments

Emil Jebe, Iowa State College

Informal discussion

Regional Meetings of the Econometric Society
Santa Monica, August 2-4, 1951, at The Rand Corporation, (Jointly with the Southern California Econometric Association)

CURRENT STATISTICAL PROJECTS OF THE FEDERAL GOVERNMENT

U. S. National Committee on Vital and Health Statistics

The United States National Committee on Vital and Health Statistics was established by the Surgeon General of the Public Health Service early in 1949, upon the recommendation of the First World Health Assembly, to "study broadly the problems of producing satisfactory national and international statistics in the field of health." The Committee has assumed as its most important functions the delineation of problems in vital and health statistics, and the development of plans for obtaining needed statistics dealing with various health problems. It will also attempt to guide and stimulate studies of technical problems in the field of vital and health statistics interpreted in the broadest sense, by working through technical subcommittees and other committees and organizations.

The Committee has devoted much of its time to clarifying issues concerning various problems in the fields of morbidity statistics, military health statistics, medical care statistics, hospital morbidity statistics, fetal and neonatal mortality statistics, and fertility and population statistics. Future activities of the Committee will include work by subcommittees on the problems of obtaining statistics on causes of fetal death; exploration of the possibility of developing a statistical code for classifying physical impairments; problems connected with the International Statistical Classification of Diseases, Injuries and Causes of Death; and review of national needs for data on morbidity.

The Committee is comprised of a group of experts who represent technical fields or areas of interest rather than the organizations with which they are affiliated. Members of the Committee are: Lowell J. Reed (chairman), Johns Hopkins University; Halbert L. Dunn (vice chairman), National Office of Vital Statistics, Public Health Service; I. M. Moriyama (secretary), National Office of Vital Statistics; George Baehr and Edwin F. Daily, Health Insurance Plan of Greater New York; F. C. Beelman, National Security Resources Board; Paul M. Densen, Graduate School of Public Health, University of Pittsburgh; Harold F. Dorn, National Institutes of Health; W. Thurber Fales, Baltimore City Department of Health; Eugene L. Hamilton, Office of the Surgeon General, Department of the Army; Philip M. Hauser, University of Chicago; and P. K. Whelpton, Population Division, United Nations.

I. M. MORIYAMA

Chief, Mortality Analysis Branch, National Office of Vital Statistics, U. S. Public Health Service

BLS Comparative Factory Performance Program

The Economic Cooperation Administration is conducting a technical assistance program to improve productivity in European plants. As part of this program, technical teams (including workers, union leaders, industrialists, economists, and government representatives) have visited the United States to study methods of measuring productivity. These teams have asked that a "yardstick" be provided by which productivity could be measured, including data not previously available on each department or process basis used and information on the equipment or staffing pattern.

In response to this request, the Bureau of Labor Statistics is undertaking a Comparative Factory Performance Program, giving a complete description of how each product surveyed is manufactured. About 90 products in about 14 industries are being surveyed. Schedules are prepared for each industry and in some cases for each product, in close collaboration with the industry's association, individual plants, industry engineers, and interested labor unions. Each field schedule has the following subdivisions: product specifications; production—scheduling and man-hours; equipment; staffing; materials handling; work flow and inspection; and plant operations.

The industries and products included in the surveys were requested by the countries participating with ECA in the productivity program. Plants selected for the survey are not a statistical sample of the industry, but were selected for comparability to European plants in size and product manufactured.

THOMAS G. GENTEL

Division of Productivity, Bureau of Labor Statistics, Washington 25, D. C.

Office of Education Study of Faculty Dismissals

In March of this year the Office of Education was confronted with a situation demanding prompt action. First, there had been widespread newspaper publicity regarding large-scale "firing" of faculty members in a few colleges. Second, there had been wide circulation of findings from a small investigation conducted by the *New York Times*, which also painted a dark picture regarding prospective faculty dismissals. Third, several educational foundations expressed a desire for some reliable, factual information regarding college plans for reduction of faculties.

In this situation, the Office of Education launched a quick survey through a one-page questionnaire addressed to all institutions of higher education. Within six weeks replies had been received from 1,527 institutions, or 81 percent of all the institutions addressed. The results showed that 61 percent (926) of the responding institutions did not plan to dismiss any faculty member for financial reasons. A small percentage of the institutions reported that they were still uncertain. The remaining 554 institutions, or 36 percent, reported that they planned to dismiss an average of about 8 percent of their faculties (4,008 faculty members), for financial reasons. Although this number of prospective dismissals amounts to only 3.4 percent of the faculty members in the 1,527 institutions reporting, it must be remembered that the loss is felt institution by institution; the average loss of 8 percent of the faculty of an institution would almost certainly create significant weaknesses in the institution.

The possibility of bias in the returns could not be fully investigated. In general, those institutions not planning to dismiss any faculty members for financial reasons could fill out the questionnaire most easily. Hence it is likely that the early returns underestimated the extent of the problem. In view of the high rate of response, it is not likely that the bias is serious. A check on the extent of bias, however, will be made by comparison of early returns with later returns, which are still coming in.

Partly on the basis of the returns of this survey, the Fund for Advancement of Education (recently established by the Ford Foundation) has made a grant of \$2,280,000 for a fellowship plan to "increase the competency of younger college instructors and reduce the shock of mobilization to university faculties." The latter program will provide as many as 500 fellowships for college instructors who might otherwise find themselves, as a result of reduced college enrollment, without jobs and without funds to continue advanced study. Other foundations and organizations have also taken cognizance of the survey results with varying ameliorative actions.

A brief preliminary report on the findings of the survey was published in the May 15, 1951 issue of *Higher Education*.

HERBERT S. CONRAD

Office of Education, Federal Security Agency

Conference of Mental Hospital Administrators and Statisticians

A group of mental hospital administrators and statisticians, representing 11 States that provide care for 55 percent of all patients in State mental hospitals, met in Washington on February 26-28 to discuss how more adequate statistics could be obtained on the hospitalized mentally ill. This meeting, sponsored by the National Institute of Mental Health, was the first of its kind to be held in this country. The 11 States represented were

Arkansas, California, Illinois, Louisiana, Michigan, Nebraska, New Jersey, New York, Ohio, Pennsylvania and Virginia.

The purposes of the conference were: (1) to define the kinds of statistical data currently needed on the mental hospital population of the United States; (2) to explore the possibility of standardizing definitions of terms so that inter-State comparisons might be more valid; (3) to explore research possibilities of data collected on the State mental hospital population; and (4) to explore the possibility of setting up a Model Reporting Area for mental hospital statistics.

Both administrators and statisticians indicated their specific needs for statistical data and pointed out the inadequacy of the type of data now being collected. From the administrative point of view, major emphasis was on the need for personnel standards, such as setting up ratios of patients to specific types of personnel.

Several papers were presented on research uses of mental hospital data. Follow-up studies of hospitalized patients in New York, Ohio, Pennsylvania and the Veterans Administration system were reported, and a control study of the effect of optimal care and therapy in California was also described.

The development of the new nomenclature and statistical classification, under the auspices of the American Psychiatric Association, was outlined, and there was dis-

cussion of the possible effects of the introduction of this nomenclature on mental hospital statistics.

The National Institute of Mental Health proposed that the conference group constitute itself a Model Reporting Area for mental hospital statistics. In view of the obvious benefits to be derived from the establishment of such an Area, the conference group agreed to form the nucleus of a Model Reporting Area, and will aid in establishing and maintaining standard definitions, tabulations and classifications to achieve more uniform and meaningful statistics. Other States will be encouraged to develop or improve their statistical systems and eventually to become part of the Model Reporting Area.

The conference passed specific recommendations on trial use of certain definitions and adoption of the new nomenclature by mental hospitals. Standing committees on definitions, tabulations and statistical classification of psychiatric disorders were created to expedite the establishment and aid the functioning of the Model Reporting Area.

At the suggestion of Dr. R. H. Felix, Director of the National Institute of Mental Health, the conference group agreed to consider itself an Advisory Group on Statistics to the National Institute of Mental Health.

MORTON KRAMER, Chief,

Biometrics Branch, National Institute of Mental Health

Teaching Opportunities Abroad

In Lebanon—At University of Beirut, Assistant or Associate Professor of Economics. Assistant Professor of Business Organizations or Assistant Professor of Statistics and Accounting. Assistant Professor in Mathematics and Sociology.

In Turkey—At Robert College, Istanbul, Assistant Professors in Physics and Engineering and Advanced Mathematics. Instructors in the Biological Sciences, Physics and Mathematics and Commerce.

Inquiries about these positions should be directed to Miss Elizabeth Ralston, Near East College Association, 46 Cedar Street, New York 5, N. Y.

National Society of Military Accountants and Statisticians

Capt. Joseph C. Armour (USA), Comptroller, Brooke Army Medical Center, has been named new president of the National Council of the Society of Military Accountants and Statisticians.

Col. Bickford E. Sawyer (USA), Comptroller, Fourth Army, will serve as Auditor General of the society and Maj. Louis A. Oswald (USAF Res.), a member of the San Antonio Public Service Board, will act as Advocate General for the group during the coming year.

Other officers elected at the annual meeting of the society held in San Antonio were:

Maj. Samuel V. Anthone (USAF Ret.), assistant professor, Miami University, and Capt. Garnett M. Burum (USA), Management Officer, Fort Ord Station Hospital, vice-presidents Lt. Col. Lyman H. Brewster, Jr. (USAF), Comptroller, Robbins Air Force Base, Ga., secretary; Maj. Walter A. Zwinscher (USAF), Far East Air Force, designated Comptroller General of the society, and Lt. Col. Maurice Edelman (USA), Chief of Management and Fiscal Division, Camp Kilmer, N. J., named the society's Director of Finance.

Also elected were Col. Frederick B. Smith (USA), General Staff, Washington, D. C., as Historian, and Col. John E. Bodle (USAF), Comptroller, Air Training Command, as Inspector General of the organization.

New Institute for Research in the Social Sciences

University of Missouri has established an Institute for Research in the Social Sciences for the purpose of encouraging, planning, coordinating, and financing research. Dr. Charles Elson Lively of the University's Department of Rural Sociology will direct the work of the Institute.

Summer Seminar in Statistics August 6-31, 1951 University of Connecticut, Storrs, Connecticut,

The Summer Seminar in Statistics is intended to provide informal contacts and free discussions between and among academic statisticians, students, and users of statistical techniques. The principal seminar meets daily at 3 p.m. Frequent statistical clinics to discuss the solution of particular practical problems are planned.

The principal seminar—fields and organizers

Week of August 6—"Applications to Biology," C. I. Bliss (Box 1106, New Haven 4, Conn.) and J. Ipsen (375 South St., Boston 30, Mass.).

Week of August 13—"Time Series," M. G. Kendall and J. W. Tukey (Box 708, Princeton, N. J.).

Week of August 20—"Statistical Theory; Probability," M. Kac (White Hall, Cornell University, Ithaca, N.Y.) and H. Robbins (Department of Mathematical Statistics, University of North Carolina, Chapel Hill, N. C.).

Week of August 27—"Techniques of Interest in Social Science," F. Mosteller, F. L. Strodbeck (Department of Sociology, Yale University, New Haven, Conn.) and M. A. Woodbury (Box 708, Princeton, N. J.).

Those interested in the discussion of particular topics in these fields are asked to write to one of the appropriate organizers at the address given.

The clinic

Those who wish to present a practical problem for discussion are asked to write to Geoffrey Beall (University of Connecticut, Storrs, Conn.), F. L. Strodbeck (Department of Sociology, Yale University, New Haven, Conn.) or J. W. Tukey (Box 708, Princeton, N. J.).

Further information

Write the Secretary of the Seminar:

D. F. VOTAW, JR.
Leet Oliver Memorial Hall
Yale University
New Haven, Conn.

American Public Health Association

The 79th Annual Meeting of the American Public Health Association, the 18th Annual Meeting of its Western Branch and the annual meetings of 38 related organizations will be held simultaneously in San Francisco, October 29 to November 2. The combined meetings will bring together 5,000 health specialists from all parts of the Western Hemisphere.

FIFTH NATIONAL CONVENTION

The American Society for Quality Control held its Fifth National Convention in Cleveland, Ohio, on May 23rd and 24th. The attendance, which exceeded 2,500, indicates the remarkable growth of interest in the industrial application of statistical technique for quality control. The conferees came from 35 states and 2 provinces of Canada. The program featured many prominent advocates of quality control who presented interesting case histories of successful applications of not only the well recognized techniques of X and R charts and acceptance sampling but also of the advanced procedures involving analysis of variance, correlation and significance tests. Armed Services requirements and expectations of quality control departments in industry as well as the principles and practices of Military Standard 105-A, a specification of acceptance sampling procedures, were the subjects of two of the eighteen technical sessions included in the program. One session was devoted to the subject of statistics in the service of quality control. Papers by Harold A. Freeman, Professor of Statistics, M. I. T.; W. Allen Wallis, Professor of Statistics, University of Chicago and John W. Tukey, Professor of Mathematics, Princeton University, presented new aspects of potential uses of statistics in quality control.

Most of the technical papers are available in a bound volume. Copies may be purchased at \$3.50 each from Alfred E. Davis, Rochester Institute of Technology, Rochester 8, New York.

Fred C. Crawford, President, Thompson Products, Inc., Cleveland, gave a stirring keynote address at the General Assembly in which he indicated the important role quality control can and must play in our national economy if the United States is to maintain its world leadership in productivity. At the Thursday luncheon, Rear Admiral M. L. Ring, Director of Supply Management, Munitions Board, addressed the group on "Problems of Military Procurement."

At a time when emphasis seems to be on quantity, the Admiral said too much stress cannot be placed on the significance of quality. Material which fails to perform as expected would impair the morale of troops and possibly the security of the nation.

Presentation of the Society's awards was made at the Annual Banquet at Hotel Cleveland. The Brumbaugh Award for the best paper published last year in the Society's journal, *Industrial Quality Control*, was presented to Dr. Irving W. Burr, Professor of Mathematics, Purdue University, for his article "A New Method of Approving a Machine or Process Setting." Dr. Martin L. Brumbaugh, Bristol Laboratories, Syracuse, was the recipient of the Shewhart Medal Award for his pioneering efforts in and significant contributions to the science of quality control by statistical methods.

The newly elected officers of the American Society for Quality Control are: Wade R. Weaver, President; Simon Collier, Vice President; Alfred E. Davis, Secretary and Paul A. Robert, Treasurer.

Quality Control Bibliography Prepared by Cleveland Public Library

The May-June 1951 issue of *Business Information Sources Bulletin* of the Cleveland Public Library at Cleveland, Ohio, Vol. 22, No. 3, is a selection from books, periodical articles and special reports dealing with Quality Control. The period covered is from 1949 through 1950. Copies are available free upon request to members of the American Statistical Association. Please address your requests directly to Rose L. Vormelker, Head of the Business Information Bureau at the Cleveland Public Library.

The March 1951 issue of *BIOMETRICS* was in the form of a monograph on Variance Components. It is for sale at \$2.00 a copy.

1. *The present status of variance component analysis* S. Lee Crump
2. *Testing a linear relation among variances* William G. Cochran
3. *Components in regression* John W. Tukey
4. *Consistency of estimates of variance components* R. E. Comstock and H. F. Robinson
5. *Analysis of variance with unequal but proportionate numbers of observations in the sub-classes of a two-way classification* H. Fairfield Smith
6. *Variance components as a tool for the analysis of sample data* Walter A. Hendricks
7. *Use of components of variance in preparing schedules for the sampling of baled wool* J. M. Cameron
8. *Estimating precision of textile instruments* John C. Whitwell

In addition, copies of the March 1947 issue of *BIOMETRICS* containing three articles on Analysis of Variance are again in print and available at \$1.50 each.

1. *The assumptions underlying the analysis of variance* Churchill Eisenhart
2. *Some consequences when the assumptions for the analysis of variance are not satisfied* W. G. Cochran
3. *The use of transformations* M. S. Bartlett

Copies of these issues are available from the Business Office of Biometrics, Institute of Statistics, University of North Carolina, Raleigh, North Carolina.

Human Resources Research Institute

The Department of the Air Force has recently established a new social science research agency at Air University, Maxwell Air Force Base, Alabama. This agency, the Human Resources Research Institute, was authorized in July 1949 and is under the direction of a civilian social scientist, Dr. Raymond V. Bowers, former Executive Director of the Committee on Human Resources, Research and Development Board, Department of Defense. One of three Air Force research agencies in the field of human resources, the Institute has been assigned a broad mission, focussed on the educational, social psychological, and sociological problems of the Air Force. This mission includes research problems of (a) officer education and personnel, (b) military management and manpower utilization, and (c) strategic intelligence and psychological warfare. The research interests of the Institute in these three areas encompass such varied problems of personnel operations as leadership, morale, officer career guidance, manpower utilization, group motivation, organizational intelligence and psychological warfare operations as related to the social and psychological vulnerabilities of foreign nations. Being a part of the research and development program of the Air Force, the Institute has Air Force wide research responsibilities, and is responsible for developing an integrated long-range program to accomplish its mission.

The Institute has appointed an Advisory Research Council to assist in its development. The Chairman of the Council is Mr. Charles Dollard, President of the Carnegie Corporation of New York; other members include Dr. Pendleton Herring, President of the Social Science Research Council, Dr. Carl Hovland, Chairman of the Department of Psychology, Yale University; Dr. Leland DeVinney, Assistant Director of the Social Science Division, Rockefeller Foundation; Dr. Philip Hauser, Associate Dean, Division of Social Science, University of Chicago, and Dr. Carroll Shartle, Chairman, Personnel Research Board, Ohio State University. The Council meets semi-annually, or oftener on call of the Chairman, to review Institute policies and to make suggestions concerning contract research.

The Institute is developing its program of research through both contract and in-service projects. Several projects are now underway that involve contracts with universities or other research organizations. The first phase of a study of the personnel records system of the Air Force includes an analysis of the reliability and validity of the content of personnel records by Richardson, Bellows, Henry and Company, Incorporated. In the area of military management, a study of role conflict in leadership is being assisted by the Laboratory of Social Relations, Harvard University. Major research projects on strategic intelligence and psychological warfare have been started by the Bureau of Applied Social Research, Columbia University, and by the Harvard Russian Research Center, both of whom have research teams working in Europe. A contract has been signed with Ohio State University to assist in the planning of the research program. Several other contracts are under consideration.

In November, the Air University Far East Research Group for Human Resources was organized by the Institute to study human factor problems in the Korean war. This group is now in Japan and Korea studying three main types of human problems: morale, training, and psychological warfare. The group has been constituted to represent all the human resources interests of the Air Force, and is the only such mission in the theater. Its members include the following: Col. George W. Croker, Officer in Charge; Major John W. Quayle, Assistant to Officer in Charge; Dr. Frederick W. Williams, Assistant Project Director; Dr. John C. Pelzel; Dr. John W. Riley, Jr.; Dr. Wilbur Schramm; Dr. Thomas W. Harrel, Assistant Project Director; Dr. Roger M. Bellows; Dr. Francis G. Cornell; Mr. Daniel L. Camp; Dr. Nicholas J. Demerath; Dr. Nathaniel L. Gage; Dr. E. William Noland; Dr. Floyd L. Ruch; Dr. S. Rains Wallace; and Mr. Earl A. Waller.

The organizational plans of the Institute call for the staffing of six research divisions grouped under three

directorates, each of the latter being headed by an Assistant Director. Dr. Fred Couey is Assistant Director in Charge of the Directorate of Officer Personnel and Education Research, and Dr. Samuel Goodman is head of the Educational Research Division of that Directorate. Other members of the Educational Research Division include Dr. Francis DiVesta, Mr. Paul Freeman, and Mr. Earl Waller.

Other civilian staff members include Dr. Frederick Williams, Program Director of the Psychological Warfare Division; and Dr. Dinko Tomasic, Project Officer in the same Division. Mr. Daniel Camp is Assistant Project Officer in the Human Relations and Morale Division; Dr. Glaister Elmer has recently joined that Division as Research Assistant.

The Institute is fortunate in having a number of professionally trained officers. Col. Dale Smith has recently completed his doctorate study at Stanford University, and has been named Assistant to the Director. Other military personnel trained in social science research include Col. George Croker, Assistant to the Director for Requirements; Maj. John Quayle, Project Officer, Manpower; Maj. Charles Botsford, Assistant Project Officer, Manpower; Maj. Norman Green, Assistant Project Officer, Education; Capt. Robert Murphy, Assistant Project Officer, Personnel; Capt. Evan Stevens, Assistant Project Officer, Psychological Warfare; and 1st Lt. Truman Salyer, Assistant Project Officer, Personnel.

Inquiries with reference to employment or contracts should be addressed to the Director, Human Resources Research Institute, Maxwell Air Force Base, Alabama.

Symposium on the Solution of Simultaneous Equations and the Determination of Eigenvalues

As part of the Semicentennial Celebration of the National Bureau of Standards, a Symposium on the Solution of Simultaneous Equations and the Determination of Eigenvalues will be held at the Institute for Numerical Analysis (a section of the NBS Applied Mathematics Laboratory) at Los Angeles, California, on August 23-25, 1951.

The symposium will include surveys of methods, both theoretical and practical, and related computational procedures adapted to hand machines, punched card equipment, and automatic digital computing machines for the solution of the two types of problems.

A. Ostrowski (Basle, Switzerland), E. Stiefel (Zurich, Switzerland), and C. E. Froberg (Lund, Sweden), will present papers on the Inversion of Matrices. A. S. Householder (Oak Ridge), P. S. Dwyer (Michigan) and speakers from the NBS will also report on this subject.

The Determination of Eigenvalues will be discussed by H. Wielandt (Tubingen, Germany), R. A. Frazer (NPL, England), G. Fichera (Trieste), and F. Rellich (Gottengen, Germany) from abroad. Also H. H. Goldstine (Institute for Advanced Study, Princeton), N. Aronszajn (Oklahoma A & M), A. Weinstein (Maryland), A. T. Brauer (North Carolina), and speakers from the NBS will present papers. The chairman of the symposium will be Professor J. Barkley Rosser of Cornell University.

Bulletin on Sampling

The New York State School of Industrial and Labor Relations, Cornell University, Ithaca, New York has recently issued a bulletin by Professor Philip J. McCarthy entitled *Sampling—Elementary Principles*. This bulletin presents a brief, technical discussion of some of the aspects of sample design with particular reference to the estimation of population proportions. (Random, stratified random and cluster (with clusters of equal size) sampling are treated in some detail. Short accounts are given of systematic sampling, of sampling of unequal sized clusters and of the practical problems arising in the execution of a sample design.)

Single copies of the bulletin will be sent free of charge to residents of New York State. In the case of bulk orders (more than five copies and out-of-state orders, a nominal charge will be made to cover direct costs (25 cents per copy in the case of this bulletin).

CHAPTER NOTES

AUSTIN, TEXAS

The March meeting of the chapter was held in connection with a meeting of the Committee on the Southwest Economy appointed by the President's Council of Economic Advisors. Dean Robert W. French of Tulane University, chairman of the Committee on the Southwest Economy, described the work of the committee.

Officers for 1951 are: President, Jack G. Taylor, Business Manager, The University of Texas; Vice-President, N. K. Woerner, Statistician, Texas Department of Public Safety; Secretary, John R. Stockton, Director, Bureau of Business Research, The University of Texas.

BOSTON

At the annual meeting of the Boston Chapter on May 24th Miss Sybil P. Bindloss, research associate, Research Department, Liberty Mutual Insurance Company, spoke on the subject "Financing the Cost of Medical Care—Some European Prescriptions."

Officers elected for the year 1951-52 were: President, William W. K. Freeman, Mutual Boiler and Machinery Insurance Co.; vice-president, E. Lafayette Quirin, Babson's Reports; secretary, Wilfred S. Lake, Northeastern University; treasurer, Robert L. Hurley, United Mutual Fire Insurance Company; counselors, Harold A. Freeman, M. I. T.; Frederick Mosteller, Harvard University.

It was noted that the retiring president, Roswell F. Phelps, had completed 29 years of service in the chapter during which he had been secretary for 27 years and president for two years.

CENTRAL INDIANA

Oliver Castle, assistant director of research at A. C. Nielson Company, Chicago, was the guest speaker at the Central Indiana Chapter's February dinner meeting. Mr. Castle's topic was "Application of Area Sampling in Business Research." He discussed some of the techniques in selecting and using area samples which the Nielson Company employs to compute their food, drug, and radio indexes.

Members and guests of the Chapter met in Indianapolis on March 15th. Adolph O. Berger, Director of the Chicago Regional Office of the Bureau of Labor Statistics, spoke to the group about Various Aspects of the Consumer Price Index. He described briefly the history and development of the consumer price index, how it is computed, why revisions are necessary, current uses of the index, the "interim" revision, and status of the current general revision.

The Central Indiana Chapter elected the following officers for 1951-52: President, Dwight Kelley, Indiana Employment Security Division; first vice-president, Carl Kossack, Purdue University; second vice-president, Perry Wysong, Eli Lilly and Company; secretary-treasurer, Richard Shaw, Naval Ordnance.

Mr. Roy Adams, retiring president, was speaker for the election meeting on April 19. His topic was "How Public Welfare Assistance is Determined and Who Gets It." At the last meeting of the year on May 17, Mr. Lester S. Kellogg, Economist with Deere & Co., Moline, Ill., was the speaker for the evening. His topic was "Can I Keep My Business From Being Controlled by Statistics."

Indiana University was host to members of the Central Indiana Chapter on May 17, the last dinner meeting of the 1950-51 season. Lester S. Kellogg, economist with Deere & Company, Moline, Ill., was guest speaker. His topic was "Can I Keep My Business From Being Controlled by Statistics."

CENTRAL NEW JERSEY

At the February 5 meeting, Professor John W. Tukey of Princeton University spoke on "Spectra in Economics." At the February 26 meeting, Professor A. J. Coale of Princeton spoke on "Some Problems of Measurement in Economics."

Clyde V. Kiser spoke at the March meeting on "Problems encountered in a Study of Fertility in Relation to Differences between Actual and Desired Levels of Living."

The Central New Jersey Chapter voted on the following slate of officers at its May meeting: President, K. A. Brownlee, biometrician at the Squibb Institute for Medical Research at New Brunswick; vice-president, Max A. Woodbury, research associate in mathematics and economics at Princeton University; secretary-treasurer, William Netschert, Jr., supervisor of the Research Section of the New Jersey Division of Employment Security; assistant secretary, Miss Mary E. McKallen.

The April meeting was devoted to a speech by Joseph Hochstim of the Bureau of Labor Statistics on "Interviewer Variability."

CLEVELAND

The annual meeting of the Cleveland Chapter on May 14 was addressed by Arynnes Joy Wickens, Deputy Commissioner of Labor Statistics and President-Elect of the American Statistical Association. Mrs. Wickens spoke on "Revision of the Consumers' Price Index."

The following officers were elected for the 1951-52 term: President, Eugene S. Root, Erie Railroad; vice-president, Gale R. Ober, Jr., Howard Whipple Green and Associates; secretary, Myron F. Vincent, Ohio Bell Telephone Co.

The Business Statistics Section of the Chapter held five meetings during the year. The meeting of June 6, 1951, celebrated the silver anniversary of this group. Past chairmen of the section were honored for their contribution to statistics and the development of the section. Bradford B. Smith, economist, United States Steel Corporation, and a past chairman of the section, spoke on the development of business statistics during the past 25 years and the role of

business statisticians in providing knowledge and understanding of our economy.

COLUMBUS

Officers for the 1951-1952 term are: Dr. Raymond F. Sletto, the Ohio State University, President; Mr. Samuel McGavran, the Ohio Chamber of Commerce, First Vice-President; Mr. Donald E. Smeltzer, Ohio Department of Public Welfare, Second Vice-President and Dr. Mikhall V. Condoide, the Ohio State University, Secretary-Treasurer.

CONNECTICUT

The March meeting was devoted to a paper on "Rapid Tests of Association" given by M. H. Quenouille, Head of the Department of Statistics at Marshal College, University of Aberdeen. Professor Quenouille is a visiting lecturer on statistics at Yale University this year. The May meeting heard Geoffrey Beall, professor of statistics, University of Connecticut, speak on "Statistical Methods in Industrial Technical Laboratories."

DENVER

The March meeting of the Denver chapter was held jointly with the American Society for Quality Control. The speaker was Charles S. Barrett, Director of Quality Control at the Hawthorne Plant of the Western Electric Company in Chicago. Mr. Barrett spoke on Statistics in Quality Control.

Officers of the Denver Chapter for 1951-52 are: President, Dr. Fred Oberlander, director of personnel research, Gates Rubber Company; first vice-president, Mr. E. Webb Stacy, assistant professor of statistics, University of Wyoming; second vice-president, Miss Rose Myrtle Humiston, teacher, Byers Junior High School, Denver Public Schools; secretary-treasurer, Dr. Virginia M. Brown, assistant professor of psychology, University of Denver.

Awards of membership in the Denver Chapter and in the American Statistical Association were given to the following students in recognition of outstanding work in the study of statistics: B. Blain Bradford from the University of Colorado; Albert D. Prochnow from the University of Wyoming.

The speaker at the April meeting was Stanley Johnson, assistant to the advertising director, Gates Rubber Company, whose topic was "It Pays to Advertise, Providing . . ."

For the final meeting of the year, a panel discussion was held on the topic "The Making of a Statistician." Participants were: The Preparation at the College Level—E. Webb Stacy, assistant professor of statistics, University of Wyoming; The Internship of the Statistician—F. L. Carmichael, director of business and social research, University of Denver; Sink or Swim—George E. Hawkins, chief statistician, The Mountain States Telephone and Telegraph Company.

DETROIT

Ray R. Eppert, of the Burroughs Adding Machine Company, spoke at the January meeting on "Application of Statistical Methods to Sales Administration Problems."

In February, the chapter met jointly with the American Society for Quality Control to hear Martin Brumbaugh, of the Bristol Laboratories, speak on "Should Management Hire Statisticians?"

The March meeting was devoted partly to business and the election of this year's officers. Oscar F. Stewart was elected President, Kurt Benjamin Vice-president and Nelson Hermance is the new Secretary-Treasurer.

At this Annual Business Meeting the chapter acted as host to seven statisticians from Austria, Italy, France and Greece, who are touring the United States under the auspices of the Economic Cooperation Administration and the Bureau of Labor Statistics.

NEW YORK

Mortimer Spiegelman was elected president of the New York Metropolitan Chapter at the annual meeting on May 22. Mr. Spiegelman is assistant statistician, The Metropolitan Life Insurance Company. Other officers elected included Herbert Arkin, secretary, and Lazare Teper, executive counselor. The remainder of the officers were elected last year to serve for two years.

The nominating committee consisted of Walter Mitchell, Jr., chairman; Helen Slade, H. Ashley Weeks, Norris O. Johnson and Waite S. Brush ex officio.

The annual meeting, which took place in the club room of the International Business Machines World Headquarters, was followed by a demonstration of electronic machines and description of new methods of computation, and orientation to selective sequence electronic calculator. The speakers were Dr. C. C. Hurd, R. Seeber, Jr., and John W. Sheldon.

Other features of the program were a talk on "Divorce Statistics" by P. H. Jacobson of the Metropolitan Life Insurance Co., and a paper on "Soviet Statistics" by Harry Schwartz of the New York Times.

The Statistical Techniques Division has also been very active. The April meeting was addressed by Jack C. Kiefer, of Columbia University, who spoke on "Basic Ideas of Wald's Statistical Decision Theory"; and in May, Prof. Henry Scheffe of the Department of Mathematics of Columbia University, discussed Model I and Model II Effects in Analysis of Variation and Their Appropriateness in Application.

PHILADELPHIA

Abner Hurwitz, Chief of the Cost of Living Branch of the Bureau of Labor Statistics, spoke at the March 2 meet-

ing of the Philadelphia chapter. His topic was "The Consumers' Price Index."

The April meeting heard Robert F. Main, a financial consultant, speak on "Evaluating Income and Earning Power in Common Stock Analysis." Mr. Maine reviewed the usual statistical tools used in appraising corporate earning power and discussed the capitalization of earning power and some particular applications of statistics in the industrial field. The May meeting was devoted to a discussion of Problems of "National Income Estimations in India" by Dr. Simon S. Kuznets of the University of Pennsylvania and the National Bureau of Economic Research. Dr. Kuznets returned recently from India where he was serving as a consultant to the Indian Government.

SAINT LOUIS

Dr. Philip DuBois, Professor of Psychology, Washington University, spoke to the February 28 meeting on "Forecasting Human Behavior." The Saint Louis chapter is considering the possibility of organizing special groups within the chapter to focus on particular problems.

The April meeting was devoted to a discussion of "Forecasting Production Patterns" by Guy S. Freutel. Mr. Freutel worked on the 'input-output' studies sponsored by Harvard and is now constructing a regional input-output table for Washington University.

The May meeting of the chapter was planned as a joint meeting with the American Marketing Association. Arnyess Joy Wickens, Deputy Commissioner of Labor and President-elect of the American Statistical Association, spoke on "Measuring Prices."

Edward B. Olds was elected President and Don Paul elected Secretary of the St. Louis chapter for the coming year. Harold Silverman of the Jewish Employment and Vocational Service is chairman of the Employment Committee of the St. Louis Chapter. Anyone wishing to list job openings or who is interested in job placement in the St. Louis area should get in touch with Mr. Silverman.

UNIVERSITY OF ILLINOIS

The March meeting heard Charles E. Osgood, associate professor of psychology speak on "New Statistical Methods Applied to the Study of Meaning." Professor Osgood illustrated his lecture with lantern slides.

At the April meeting, Leonid Hurwicz, research professor of economics and mathematical statistics, spoke on "The Statistical Treatment of Time Series."

The May meeting of the University of Illinois Chapter heard a speech by V. Lewis Bassie, Director of the Bureau

of Economic and Business Research on "Study of Stock Market Trends as an Indicator of Speculative Psychology." This meeting was also the business meeting of the chapter and the following officers were elected: President, Robert Ferber; vice-president, Horace W. Horton; secretary-treasurer, Colin R. Blyth.

The May meeting heard Donald B. Williams speak on "A Survey of Farmers' Price Expectations."

NORTH CAROLINA

The North Carolina Chapter elected the following officers for the year 1951-52: President, Mr. Ralph W. Pfouts, Department of Economics, School of Commerce, University of North Carolina; vice-president, Mr. S. N. Roy, Department of Mathematical Statistics, University of North Carolina; secretary-treasurer, Mr. B. G. Greenberg, School of Public Health, University of North Carolina.

WASHINGTON

At the February 19 meeting, J. Stevens Stock of the Bureau of Labor Statistics, and Roger Chaufournier of the University of Illinois discussed economic concepts underlying the Consumers' Price Index and the problems involved in placing the index on a statistical basis in the probability sense.

Benjamin Caplan of the Council of Economic Advisers was the chairman.

A seminar in Electronic Processing of Paper Work will be conducted in a series of six meetings to be held jointly with the Society for the Advancement of Management. The first of these meetings was held on February 21.

The March meeting was devoted to a discussion of College Manpower. Robert C. Story, head of the Technical Services Unit of the Research and Statistical Standards Section of the U. S. Office of Education, spoke on "Is There Danger of a College Manpower Famine?" and John W. French of the Educational Testing Service at Princeton spoke on "Methods of Selecting Students for College."

The April meeting, held jointly with the District of Columbia Sociological Society, heard a speech by Louis Guttman, Director of the Israel Bureau of Social Research, on "New Developments in Measurement of Opinion and Attitudes."

The June meeting was devoted to a discussion of the "Statistics Behind Wage Stabilization" by Harry M. Douthy, Chief of the Division of Wage Statistics, Bureau of Labor Statistics.

Since the June meeting was also the annual meeting of the society, the members present elected officers for the year 1951-52. The new officers are: President, Selma Goldsmith; vice-president, John Smith; secretary-treasurer, Margaret Gurney.

NEWS about MEMBERS

B **R. R. Bahadur**, who received his Ph.D. in Mathematical Statistics at the University of North Carolina in 1950, is now an Instructor for the Committee on Statistics at the University of Chicago. **T. A. Bancroft** has been appointed Head of the Department of Statistics and Director of the Statistical Library Jose State College.

C **Gladys N. Conly** has accepted a position on the staff of the International Labour Office in Geneva where she is working on international standard classification of occupations in the Statistical Division.

Arden B. Crawford has been appointed vice-president of Industrial Surveys Company, Inc. He will assume the responsibility of supervising all client service work for New York clients. Mr. Crawford was formerly with the sales and merchandising department of the Nestle Company and before that with A. C. Nielsen Company.

E **R. J. Eggert** has left the American Meat Institute and is manager of the Ford Division Research Department of the Ford Motor Company. He is responsible for the development of basic consumer surveys in the areas of styling, design, quality of manufacturer and dealer service for determination of methods and techniques to be used in these surveys and for the preparation of additional product and market studies as may be required by the company.

F **William J. Fellner** is now at the Littauer Center, Department of Economics, at Harvard University.

Bernard Frank has accepted the position of Chief of the Morbidity and Mortality Unit of the Division of Medical Statistics of the Veterans Administration in Washington, D. C.

G **Harold Glassman**, formerly with the Bureau of Labor Statistics' Office of Statistical Standards, has joined the statistical staff of the Department of the Air Force in Washington, D. C.

Roe Goodman, who for the past four years has been head of the sampling section of the Survey Research Center, University of Michigan, has accepted a position on the United Nations Technical Assistance Mission to Thailand. He and his family departed for Bangkok in June where he expects to be located for a minimum of one year.

H **Henry Halpern** research director, Ward Wheelock Company, advertising, Philadelphia, is on a military leave of

absence and is presently serving in the Office of Progress Reports and Statistics, Office of the Secretary of Defense, the Pentagon, Washington.

Ralph C. Heath has been recalled to active duty with the Army Air Force and is stationed at the Wright Patterson Air Force Base working in the Military Division. Miami University has given Major Heath a leave of absence to cover his period of military duty.

Paul Horst has returned to the Department of Psychology at the Washington University in Seattle after a year as a Director of Research in the Educational Testing Service at Princeton, N. J.

K **Louis B. Kahn** has left the University of Georgia to work at the University of California as an Assistant Specialist. He is working on a study covering the determination of a technique by which the volume of grapes going into wine production may be controlled on the basis of disease incidence.

William Kruskal is now associated with the Committee on Statistics at the University of Chicago.

L **Stanley W. Laird** is now working as a mathematical statistician in the Productivity and Technological Developments Division of the Bureau of Labor Statistics of the U. S. Department of Labor in Washington.

Morten M. Lenrow has left Esquire, Inc. and is now assistant director of research at the American Weekly.

M **William B. Michael** is working as Associate Professor of Psychology at San Jose State College.

N **Gottfried E. Noether** of New York University has been appointed to an assistant professorship in mathematical statistics at Boston University.

H. W. Norton has resigned as Statistician with the Atomic Energy Commission to become Professor of Agricultural Statistics in the Illinois Agricultural Experiment Station and the University of Illinois.

P **A. E. Paull**, formerly Biometrician for the Grain Research Laboratory at Winnipeg, Canada, is now working for the Abitibi Power Company in Toronto.

Paul Peach is now Head of the Data Analysis Branch, Test Department at the Naval Ordnance Test Station, China Lake, Calif.

Raymond P. Peterson, Jr., formerly with the Institute for Numerical Analysis in Los Angeles, has received his Doctorate from UCLA and has accepted a position as an Instructor of Mathematics at the University of Washington.

Frank Proschan formerly of the Atomic Energy Commission in New York is now with the National Bureau of Standards in Washington.

R **Albert J. Raebbeck** formerly instructor in economics at Princeton University, has joined the staff of the Bureau of the Budget, Division of Statistical Standards.

P. Ratoosh formerly a Lecturer at Columbia University is now an Instructor in the Department of Psychology at the University of Wisconsin.

Paul R. Rider is now at the Wright-Patterson Air Force Base where he is mathematical and statistical adviser to the Flight Research Laboratory. Mr. Rider has taken a year's leave of absence from Washington University.

S **Rosemary Savey** has accepted a position as Instructor in Statistics and Research Assistant at the Bureau of Research, University of Toledo.

Irving H. Siegel, lecturer in political economy at Johns Hopkins University and director of productivity studies at Johns Hopkins Operations Research Office for the past two academic years has been appointed co-director of a Twentieth Century Fund study of the economic effects of technological developments.

Tillman M. Sogge, Chairman of the Department of Economics and Sociology at St. Olaf College, Northfield, Minn., is spending the summer in Tokyo, Japan as an Economic Consultant to the Economic and Scientific Section of the Supreme Commander for Allied Powers. He will advise on commodity and industry classification problems. This is Dr. Sogge's fourth visit to Japan as an economic consultant during the American Occupation of Japan.

T **Willem A. Timmerman** has returned from New York to Johannesburg in the Union of South Africa.

W **John E. Walsh** formerly with the Rand Corp. is now a consultant with the U. S. Bureau of the Census in Washington, D. C.

P. K. Whelpton is on leave of absence from the Scripps Foundation for Population Research to serve as director of the Population Division, Department of Social Affairs of the United Nations.

